

DATE OF TALK: Nov. 22, 2013 TIME: 10:30 am

TITLE: Observation of Electron Neutrino Appearance from a Muon Neutrino Beam and more

ABSTRACT:

In 2011, T2K published a result that reported a non-zero θ_{13} , the last unknown mixing angle in the lepton sector at that time, at 2.5 sigma level of significance which was the first evidence of non-zero θ_{13} by a single experimental measurement. Recently, after analyzing two more years of data taken since 2011, the T2K experiment reported "Observation of electron neutrino appearance from a muon neutrino beam" at 7.5 sigma level of significance. While neutrino oscillation has been well-established since the discovery by the Super-Kamiokande experiment in 1998, there have not been a definitive observation of neutrino oscillation in a so-called "appearance mode", and this new T2K observation is the first time an explicit neutrino flavor (electron) appearance is observed from another neutrino flavor (muon). This observation also opens the door to study CPV in neutrinos. When incorporating recent precision measurements on θ_{13} by the reactor experiments, especially Daya Bay, along with other neutrino oscillation parameter measurements, T2K data show an intriguing initial result on the δ_{CP} .

In this talk I will present the details of this discovery and its importance to the future CP-violation measurements in the lepton sector. I will also describe the T2K experiment in some detail, and present other recent results, in particular results from the muon neutrino disappearance studies using full T2K Run 1-4 data.

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